

Stormwater Management in Healthcare 2016

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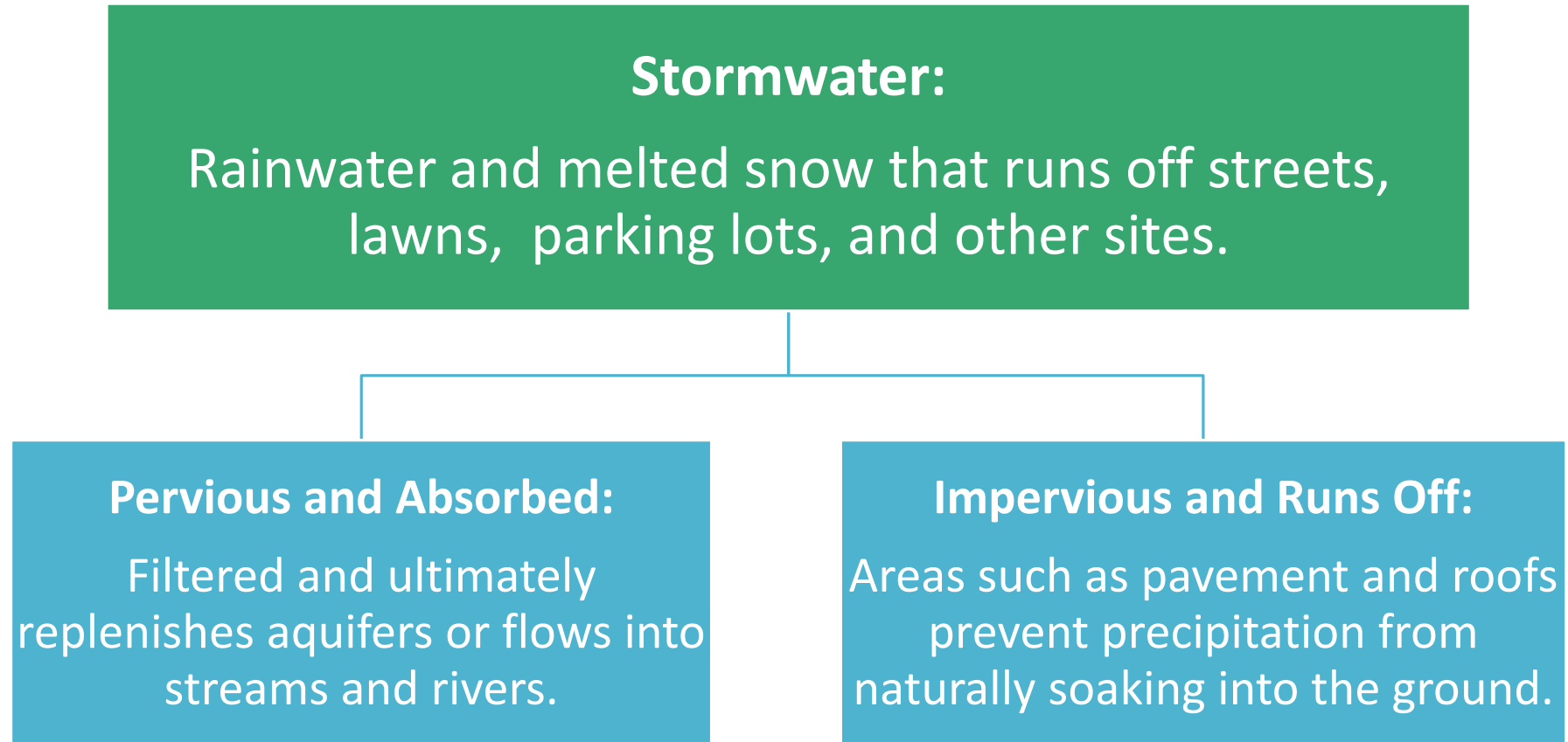


Plisko Sustainable Solutions (PSS) is a woman-owned small business, providing expertise in:

- Environmental health and policy,
- Sustainability programming, and
- Exposure assessment/industrial hygiene.

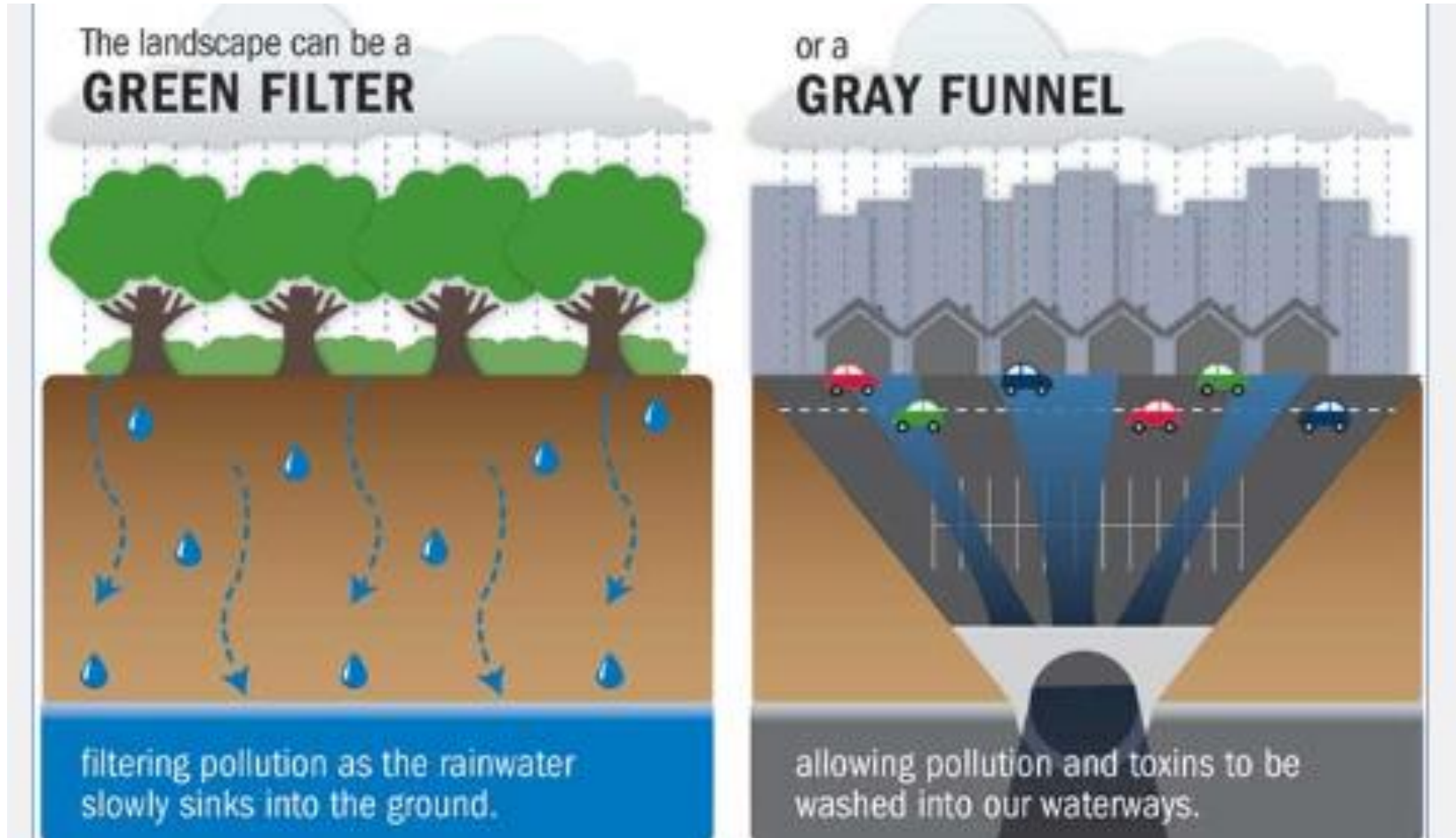
PSS develops and implements customized, strategic, and structured solutions.

Stormwater: A Resource; Not a Waste



Pervious v. Impervious

Pervious
and
absorbed



Impervious
and runs off

Stormwater Stew

As water flows off of streets, parking lots, and building rooftops it picks up:

- ✓ Fertilizers and pesticides from lawns and gardens
- ✓ Oil, grease, and toxics from motor vehicles
- ✓ Road salt
- ✓ Pet waste
- ✓ Other pollutants



Costs of Polluted Stormwater

Polluted water running into storm drains, sewer systems, and drainage ditches can cause:

- ✓ Contaminated rivers and streams
- ✓ Downstream flooding
- ✓ Stream bank erosion
- ✓ Polluted drinking water
- ✓ Sewer overflows
- ✓ Infrastructure damage
- ✓ Beach closures
- ✓ Fish advisories
- ✓ Habitat destruction



Health Effects of Polluted Stormwater*

Recreation/ Swimming

- Fecal coliform, bacteria and parasites may lead to:
 - Viral infections
 - Earaches
 - Eye discharges
 - Sinus problems
 - Fever and flu
 - Skin rashes
 - Gastrointestinal problems

Drinking Water

- Acute illnesses can result from consuming water contaminated with protozoan oocysts, viruses, and bacteria
- Nitrates increase risk of methemoglobinemia, causing shortness of breath and blueness of the skin, especially for **infants**
- Water with elevated nitrate is suspected to increase miscarriage risk

Seafood Consumption

- Diarrheal and paralytic illnesses caused by the hepatitis A and Norwalk viruses, *Vibrio* species, and marine biotoxins formed by algal blooms
- Insecticides in fish raise concerns about carcinogenic effects and disruption of hormonal systems in humans

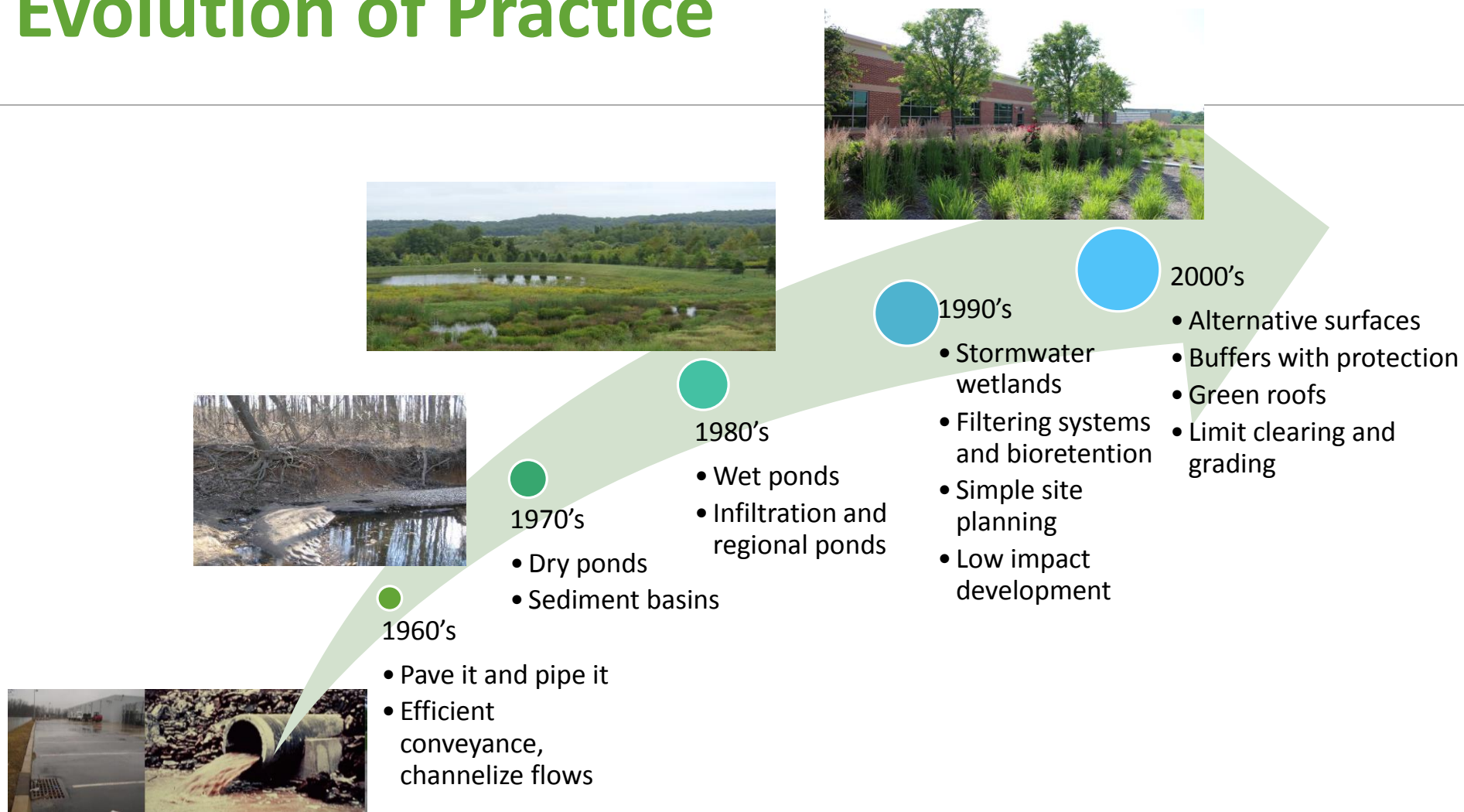
Ground Debris

- Trash and animal waste
- Disease-spreading bacteria, putting children and their families at risk in their local communities

Pooling of Stormwater

- Increased potential breeding areas for mosquitoes, the disease vectors for dengue hemorrhagic fever, West Nile virus, and other infectious diseases

Evolution of Practice



Slow it Down, Spread it Out, Soak it In!

- ✓ Bioretention cells
- ✓ Grassed swales
- ✓ Green parking design
- ✓ Infiltration trenches
- ✓ Inlet protection devices
- ✓ Permeable pavement
and/or pavers
- ✓ Rain barrels
- ✓ Cisterns
- ✓ Riparian buffers
- ✓ Sand filters
- ✓ Soil amendments
- ✓ Stormwater planters
- ✓ Tree box filters
- ✓ Vegetated filter strips
- ✓ Vegetated roofs

Pervious Pavement



Adventist HealthCare Shady Grove Medical Green Roof



Barbara Truland Butz Healing Garden

Harford County Hospital Green Roof



Courtesy of: Stewart Comstock

Hagerstown Community College



Courtesy of: Stewart Comstock

Questions?

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